CITY OF LONG BEACH

DEPARTMENT OF PUBLIC WORKS

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December 16, 2009

Mr. Paul Pisano
Acting Director
Office of Transportation Operations
Federal Highway Administration
Office of Transportation Operations
400 Seventh Street. SW, HOTO
Washington, DC 20590

Att: Mr. Bruce Friedman

Subject: Progress Report for the experimental authorization No. 9-113 (E) – Green & Shared Lane Markings and Bikes in Lane Symbol Sign on 2nd Street between Livingston Avenue and Bay Shore Drive in the City of Long Beach, California (USDOT file HOTO-1)

Dear Mr. Pisano:

In your approval letter for the above referenced experiment, the City of Long Beach was required to forward to you for review progress reports. Attached is the latest progress report.

Sincerely

Mark Christoffels
Deputy Director of Public Works/City Engineer

P/ce/mark/letters/traffic/2ndstreetbikelaneprogressreportdec2009

Attachment

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Green & Shared Lane Markings and Bikes in Lane Symbol Sign on 2nd Street between Livingston Avenue and Bay Shore Drive in the City of Long Beach, California (USDOT file 9-113 (E))

Progress Report: December, 2009

The City of Long Beach, California, received permission from the Federal Highway Administration to conduct an experiment along Second Street in the Belmont Shore commercial district. KOA Corporation assisted the City in securing the demonstration and by preparing the implementation design. The project provides for placement of Sharrow bicycle markings within the outer travel lanes of Second Street. Sharrows are approved for use by the State of California and they have been allowed by FHWA on a demonstration basis in other communities. However, to augment these devices, a six-foot strip of green paint would be provided down the center of the travel lane to further indicate the appropriate position for bicyclists using the roadway.

Upon FHWA approval of the demonstration, the City of Long Beach conducted a comprehensive analysis of bicycle usage of the roadway area prior to implementation of any changes. Bicycle traffic data was collected for three days from June 5-7, 2009, at Corona Avenue with the assistance of the Long Beach Cyclists non-profit organization. The survey recorded 1200 cyclists over the 3-day period. The survey noted where each cyclist was riding, on the roadway or on the sidewalk.

The survey noted that 45% of cyclists were riding within the "door zone" where they could be struck by an opening door. 11% were riding within the right lane "taking the lane", the position that is unlikely to be involved in a crash with a vehicle door opening. This position may also provide better visibility for motorists on side streets and driveways of approaching cyclists. Most of the remaining cyclists were riding or walking on the sidewalk. This usage pattern will be used as the benchmark for conditions prior to project implementation.

Initial Implementation

Second Street was resurfaced within the project limits immediately prior to installation of the special treatments. The sharrow markings and green paint were applied overnight on June 24 and June 25, 2009. The new shared lanes were officially opened to traffic on Saturday June 27 in a "ribbon cutting" ceremony. Approximately 200 persons attended the opening festivity and rode bicycles on the shared lanes. The event received local newspaper publicity (Long Beach Press Telegram) for several days prior to and following implementation. Portable changeable message signs were provided on each end of the project area to advise all travelers about the Shared Bicycle/Auto Lane

Ahead. Poster-signs were also provided in the median of 2nd Street at various locations indicating to Ride the Shared Lane.

City staff and KOA staff have monitored the facility since its opening on a regular basis to insure that any issues are addressed. Informal observations continued through the summer, and a formal 3-day survey was repeated in late summer.

The installation has not generated any immediate concerns over safety to cyclists or improper usage by motorists. Over 3 million motorists and 50,000 cyclists have used the facility since implementation. Individual cyclists who use the lane appear to be very satisfied and comfortable. Many members of the project team have ridden bicycles within the lane and found the experience to be comfortable.

Generally no incidents of rage or concern have been observed, noted, or recorded. Motorists occasionally follow slower cyclists, but it appears evident that they are not falling behind the flow of traffic and end up queued at the next red light. There is little net travel time loss from following cyclists. Motorists are also sometimes observed changing lanes to avoid slower cyclists, just as they do to avoid a car waiting for a parking space.

The project has visibly increased the number of cyclists that choose to use the shared lane, but many cyclists continue to ride in the door zone or on the sidewalk. Interviews with individual cyclists indicate that they do not know they can ride on the green lane, or they do not wish or feel competent to use the lane.

Some cyclists are observed to travel in the door zone to pass to the right of stopped vehicles in front of them, especially during peak flow periods when automobile traffic is extremely sluggish (similar to motorcycles on a freeway, except cyclists generally pass on the right). This activity probably also occurred before the lane was implemented.

The project includes the use of special custom Share the Road signs, modified from standard to show the bicycle in line in front of the vehicle. These signs were installed about 2 months after the lane was marked. After installation, it was hoped that the signs may help cyclists to understand that they may ride in the lanes. Spot surveys of usage of the lanes indicate that there appears to be a gradual trend toward less use of undesirable riding locations, but there was no substantial change in usage that is attributed to the signs alone.

Handouts and other outreach activities are being considered to encourage wider usage of the green portion of the lane, to reduce sidewalk and door zone riding.

Public reaction has been mixed. Most persons who have inquired about the project have reacted positively after they understand the goal and purpose. Some persons believe they cannot drive their automobiles in the green lane. The number of these is not substantial enough to reduce overall equal use of both travel lanes, but it is the most

frequent concern heard from motorists. When told that it is a shared lane, most persons have accepted and understood the purpose of the project.

The project has received a lot of discussion at internet websites and discussion boards. Videos of cyclists using the facility can be found on You Tube, and many references can be found on a web search for Long Beach Sharrows. The majority of this feedback has been positive among cyclist groups.

Local cyclists have asked for more sharrows to be installed at more frequent intervals within the lanes. There is currently one sharrow on the green paint at the start of each 200-foot block.

The east end of the facility has also attracted attention in the area where the green lane begins. The green stripe begins in the second block while cyclists are intended to merge from a bike lane east of the project area toward the center of the lane in the first block. A request has been made to extend the green lane and sharrows so that it begins at the intersection where the bicycle lane ends. A treatment similar to a bike box is being considered so that bicyclists are positioned in front of vehicles at the entry point to the green lane.

The paint used for the green lane does not have strong reflective properties. The paint utilizes a standard FAA specification for green paint used adjacent to airport runways. It has been requested that the paint be enhanced to show the green color more properly at night when the coloring is nearly undistinguishable. This has been countered by concern that the paint may be slippery when wet. Reflective glass beads used to create reflectivity also may increase slipperiness. The existing paint has been informally tested for slipperiness and does not appear to be a problem.

A suggestion has also been made to modify the planned Share the Road signs to show the green stripe on the sign as background for the bicycle and vehicle. These types of changes are being considered.

Most pending suggestions appear to be intended to improve public awareness of the proper usage of the green lane especially for bicyclists. Additional measures are being considered to improve awareness.

The project was presented to the California Traffic Control Devices Committee in September, 2009. The State Committee voted to allow the experiment to continue and requested that monitoring reports be prepared and submitted to the committee. Committee members had concerns over a California Vehicle Code provision that requires bicyclists to ride as far to the right as is reasonably safe. The width of the green stripe may encourage cyclists to ride further to the left than the law intends. Committee members also expressed some concern over the need for proper or consistent usage of colored pavement. For this application, paint is being used in an area where motorists and bicyclists are expected to be joint users. In other California experiments under way colored pavement is being used in areas where non bicycle

usage is not intended, primarily for long stretches within Class II bicycle lanes where motor vehicles should not be present.

The Committee also requested that the project attempt to collect or obtain data regarding comparative use of Sharrows at similar locations where the lane has not been painted. The project team indicated that they would attempt to provide this information where it is reasonably available from other communities.

The project team considers the project to be an initial success. However the project goal will be to encourage more voluntary usage of the shared lanes over the next few months to insure the project's final success.

Three Months Usage Report

The bicycle counts and utilization study conducted before the green lanes were installed was repeated on 2nd Street thru Belmont Shore in mid September. A comparative analysis of the results is indicated below.

Measure	**Before Green Lane**	**After Green Lane**	**Change**
Total Cyclists (Fri, Sat, Sun)	1252	1614	+364
On Sidewalk	533	415	-118
In Door Zone	612	667	+55
In Green Lane Area	160	561	+401
In Left Lane	15	19	+4

Perhaps the most significant change is related to the total number of cyclists counted. While seasonal effects could apply, the after-green count showed nearly 400 more cyclists over the 3-day count period, a 29% increase in total bicyclist usage. It should also be noted that the increase in the number of cyclists riding on the area occupied by the green lane was also approximately equal to the total increase. We believe it is reasonable to assume that the presence of the green lane has been responsible for most of the increase in net usage.

One project goal was to reduce the number of cyclists on the sidewalk. The counts showed a 17% decrease in the number of cyclists using the sidewalk. They have evidently migrated to the street. A secondary goal of this project is was to move cyclists out of the door zone. The number of cyclists riding in the door zone increased slightly on a numerical basis, but the proportion of all cyclists riding in the door zone decreased. It is probable that some new bicyclists attracted to the facility did not ride within the painted area of the lanes.

Anecdotally, more car drivers seem to be using the left lane. Measurements of traffic prior to implementation indicated near equal use of both lanes. Some motorists are now observed to change to the left lane to pass slower cyclists. But others are observed to change back to the right lane after passing cyclists. There are other reasons for motorists to wish to avoid the curb lane, due to parallel parking, stopping buses, and cars waiting for pedestrians before turning right from the roadway. Due to overall capacity limitations and congestion, a significant shift in lane usage will not likely be measurable. Current bicycle usage is about one per 2-3 minutes, so few motorists will encounter a cyclist enough to produce a significant shift in lane use.

The painted green lane appears to be very successful in attracting cyclists to the facility and encouraging attracted cyclists to use the green lanes. 34% of all cyclists counted were using the green lane as designed, up from 12% before it was painted. And while there was reported initial confusion and fear about right use of the shared lane by both motorists and cyclists, time has passed and both groups have learned to share the space safely.

Interviews with selected restaurant and coffee shops have also indicated that they believe business generated by additional cyclists has improved. They are generally in favor of the experiment and have become more receptive to measures that would increase bicycle parking in the area.

Preliminary Crash Analysis

Below are total crashes and bicycle-involved crashes on police reports taken from June 20 through November 3, for 2008 (before green lane) and for 2009 (after the green lane):

June 20, 2008 to November 3, 2008:

23 reported collisions, including one involving a bicycle

- DR# 08-0059045: A motorist turned right from southbound Santa Ana Avenue to westbound 2nd Street and was struck by a bicyclist that was riding on the sidewalk, against traffic.

June 20, 2009 to November 3, 2009:

26 reported collisions, including two involving bicycles

- DR# 09-0062945: While in the Sharrow lanes a bicyclist rear ended a vehicle that had slowed to drive into a parallel parking space in front of Jones Bicycle Shop, located at 2nd Street and Pomona Avenue.

- DR# 09-0064689: A bicyclist was lane splitting between the Sharrow lanes and the parking lane (in the door zone) when he went through the intersection of 2nd

Street and Glendora. Traffic was backed up and the vehicles at the intersection had stopped to allow a vehicle to make a turn. The bicyclist had no brakes and ran into the vehicle.

The increase from one to two accidents is not significant. A longer time period would be required to determine if bicycle related accidents have increased, especially in view of the 30% increase in bicycle usage. It is reassuring to observe that there has not been a sudden increase in bicycle accident frequency. There are no reported crashes on the sidewalks, and no reported "doorings", and no crashes involving motorists overtaking bicyclists since the green lane was painted.

Comments by Law Enforcement Personnel

The project area is a popular nightlife corridor, with many bars and restaurants along the route. A traffic enforcement officer assigned to the project area filed this general comment and report on the green sharrow lanes:

> "This email is in regards to the Sharrow lane in Belmont Shore (2nd St). I have noticed since the inception that, for the most part the lane is used the way that its designer intended it to be used, that people ride in the lane at approximately 10-15MPH and not completely disrupt the flow of traffic.
>
> "I have noticed that on Friday and Saturday nights (between the hours of 2200-0300) a lot of the party goers on 2nd St are riding their bicycles to the bars. I have seen that bar patrons will ride their bicycles at a very slow pace in the lane and backing up traffic. I have seen bicycle riders pulling their friends on skateboards to their next destination. I don't think people are educated in the use of the lane because they are still riding their bikes on the sidewalk too.
>
> "These are just some of the issues that I have seen regarding the Sharrow lane.

Other significant issues reported include an incident where an officer cited a bicyclist riding properly in the green lane for riding too far to the left of parked cars (as well as for riding with headphones on). Long Beach police have been advised that bicyclists riding in the green paint should not be cited for riding too far to the left.

Also a transit vehicle did not realize the lane could be used by general traffic initially and stopped for passengers in the left lane (on the first day of implementation).

Next Steps

The project remains a demonstration for FHWA and for California at this time. Based upon results to date, the project is considered a success. There is a need to educate

more bicyclists on proper use of the lanes, but their use has not been misunderstood by new bicyclists.

Continued maintenance of the green paint has been a frequently asked question. If the treatment is ultimately approved for permanent usage, the City will consider a long life slurry treatment with green pigment, but the cost of such a treatment was not found justifiable for a trial implementation, especially if it had to be removed at the end of the experiment.

The City intends to continue to review the existing treatment and take actions that are advisable to improve the success of the experiment. The City has also fielded numerous inquiries by other Cities and bicycle advocates about the experiment and has provided available information to inquiring parties. The Long Beach Press Telegram newspaper has run a few additional articles and USA Today has also reviewed the facility.

A technical article about the lanes can be found at the following location that may require an ITE membership to view:

http://www.ite.org/councils/ped_bike/newsletters/pbcfall09.pdf

Other relevant sites with press overage or commentary include:

http://www.presstelegram.com/news/ci_12700564
http://la.streetsblog.org/2009/06/29/cyclists-pumped-about-long-beachs-green-sharrows/
http://www.lbpost.com/brian/7156

Additional questions about the facility may be directed to the following persons:

Charles Gandy
City of Long Beach
Mobility Coordinator
(562)570-6679

Rock Miller, P.E.
KOA Corporation
(714) 573-0317
Rmiller@koacorp.com

U.S. Department
of Transportation
Federal Highway Administration

1200 New Jersey Avenue, SE
Washington, D.C. 20590

May 12, 2009

In Reply Refer To: HOTO-1

Mark Christoffels, P.E.
Deputy Director of Public Works/City Engineer
City of Long Beach
Department of Public Works
333 West Ocean Boulevard
Long Beach, CA 90802

Dear Mr. Christoffels:

Thank you for your April 28 letter requesting permission to experiment with shared lane markings inside a green 5-foot wide bike strip in the center of the right-hand lane in each direction on 2nd Street between Livingston Avenue and Bay Shore Drive in the city of Long Beach and a Bikes in Lane symbol sign and supplemental plaque.

We have reviewed your request. Your request for experimentation is approved subject to the city's agreement to comply with the following additional conditions related to the five measures described in the research and evaluation plan:

- For Item 1, in addition to noting the bicycle volume in the shared lane, please note the percentage of those bicyclists who are riding within the 5-foot wide green strip.
- For Item 3, please segregate the data regarding lane choices by motorists into two categories: when a bicyclist is present and when no bicyclist is present.
- For Item 5, in addition to vehicle/bicycle crashes (which are rare occurrences), please collect data regarding conflicts between bicyclists and motorists, such as erratic or evasive maneuvers and near crashes.
- For all five items, please make some of the observations during nighttime conditions to assess the effectiveness of these traffic control devices after dark, and please indicate in the report whether street lighting is present in this corridor.

Please indicate your agreement with the above stated conditions via e-mail to Mr. Bruce Friedman of this office at **bruce.friedman@dot.gov**.

While not a condition of this approval, we also ask that you consider implementing the traffic control devices in stages to determine which device has the largest effect on motorist and driver behavior. A staged implementation might involve installing the shared lane markings first, followed by the green strip, followed by the Bikes in Lane signs.

We look forward to receiving your semiannual progress reports and your final evaluation report at the end of the study period. For recordkeeping purposes, we have assigned the following official experimentation number and title: "9-113 (E) – Green & Shared Lane Markings and Bikes in Lane Symbol Sign – Long Beach, CA." Please refer to this number in future correspondence.

Thank you for your interest in improving the operational capability and traffic safety for bicyclists through the use of these experimental traffic control devices.

Sincerely yours,

Paul Pisano
Acting Director, Office of Transportation Operations